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10/581,858

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EXAMINER

KWON, ASHLEY M

ART UNIT

PAPER NUMBER

1795

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                    |  |
|------------------------------|--------------------------------------|------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/581,858 | <b>Applicant(s)</b><br>ITOU ET AL. |  |
|                              | <b>Examiner</b><br>ASHLEY KWON       | <b>Art Unit</b><br>1795            |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/22/08, 12/27/07, 5/23/07, 6/5/06</u> . | 6) <input type="checkbox"/> Other: ____.  |



## **DETAILED ACTION**

### ***Claim Objections***

Applicant is advised that should claim 7 be found allowable, claim 8 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 3, the limitation reciting the "volume of the lithium compound ranges from 0.5 to 10 when volume of a positive electrode active material is set to 100" is indefinite because it is unclear what units or standard of comparison applicant is relying on. Specifically, the claim language imparts a conditional phrase "when...positive active material is set to 100," wherein such a conditional phrase does not clearly define a structural feature. Examiner suggests either expressing such claim language using percentages or ratios in order to clearly define the limitations of the claim. Applicant is asked to please clarify. For the purposes of this rejection this claim

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will be interpreted to mean that only portions of the layer comprising an oxide containing lithium and nickel are covered with the second lithium compound.

Claim 6-8 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: a negative electrode and electrolyte.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 4-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Mao et al. (US Pat. No. 6,071,649) (hereinafter "Mao").

Regarding claim 1, Mao discloses a positive electrode material for non-aqueous electrolyte lithium ion battery, comprising: an oxide containing lithium and nickel; and a lithium compound deposited on a surface of the oxide, the lithium compound covering nickel present on the surface of the oxide (see col. 2, lines 47-59).

Regarding claim 4, Mao discloses a positive electrode material according to claim 1, wherein the lithium compound includes lithium ion conductivity (see col. 2, lines 55-59). A lithium transition metal oxide, such as lithium cobalt oxide, contains lithium ion conductivity.

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Regarding claim 5, Mao discloses a positive electrode material according to claim 1, wherein, the lithium compound is lithium cobalt oxide (see col. 2, lines 55-59).

Regarding claim 6, Mao discloses a nonaqueous electrolyte lithium ion battery (electrochemical cell, 10), comprising: a positive electrode material including: an oxide containing lithium and nickel; and a lithium compound deposited on a surface of the oxide, the lithium compound covering nickel present on the surface of the oxide (see col. 2, lines 38-40; col. 2, lines 47-59).

Claims 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Kurasawa et al. (machine translation of JP 09-050810) (hereinafter "Kurasawa").

Regarding claim 1, Kurasawa discloses a positive electrode material for non-aqueous electrolyte lithium ion battery, comprising: an oxide containing lithium and nickel (see paragraph 11); and a lithium compound deposited on a surface of the oxide, the lithium compound covering nickel present on the surface of the oxide (see paragraphs 8, 9, and 20).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kursawa.

Regarding claim 2, Kurasawa fails to explicitly disclose a positive electrode material according to claim 1, wherein, when the lithium compound is deposited to cover substantially an entire surface of the oxide, thickness of a cover layer of the lithium compound ranges from 5 nm to 1  $\mu$ m.

However, Kurasawa discloses that it is preferred that the average thickness calculated from the mean particle diameter of a lithium nickel multiple oxide and the addition of a coating substance shall be 0.001 microns or more, or 5 microns or less (see paragraph 16). The courts have held that where claimed ranges overlap or lie inside ranges disclosed by the prior art, a prima facie case of obviousness exists (see MPEP § 2144.05). Furthermore, the discovery of an optimum value of a known result

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effective variable, without producing any new or unexpected results, is within the ambit of a person of ordinary skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980) (see MPEP § 2144.05, II.). Therefore, it would have been obvious for a person of ordinary skill in the art to optimize the thickness of the lithium compound layer in order for the battery to function at high capacity (see paragraph 16).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mao.

Regarding claim 3, Mao discloses a positive electrode material according to claim 1, wherein, the lithium compound is deposited to be sprinkled on the surface of the oxide. Mao discloses that the coat  $\text{LiCoO}_2$  used to coat the  $\text{LiNiO}_2$  was a mixture of  $\text{LiNiO}_2$  and  $\text{LiCoO}_2$ , wherein the comprised 2, 4, 8, 10, and 15 wt% of the solution. Therefore, when this mixture is used to coat the  $\text{LiNiO}_2$ , the  $\text{LiCoO}_2$  is sprinkled on the  $\text{LiNiO}_2$  surface since the  $\text{LiCoO}_2$  covers only portions of the nickel present on the surface of the oxide, and the rest is coated with more  $\text{LiNiO}_2$ .

Although Mao does not specifically recognize volumetric amounts of the lithium compound used, Mao does recognize that different weight amounts can be used to improve and thus optimize charge efficiencies (see paragraph 4, lines 45-47). Accordingly, Mao's general teaching is that the amount of the lithium compound ( $\text{LiCoO}_2$ ) used is a result effective variable (regardless with respect to what that amount applies to, i.e. weight or volume), and one of ordinary skill in the art would be able to optimize such amounts in order to provide improved charge efficiencies. The discovery of an optimum value of a known result effective variable, without producing any new or



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unexpected results, is within the ambit of a person of ordinary skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980) (see MPEP § 2144.05, II.).

Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mao as applied to claim 1 above, and further in view of Itoh et al. (US Pub. No. 2002/0051904) (hereinafter "Itoh").

Regarding claim 7, Mao discloses an assembled battery, comprising: a non-aqueous electrolyte lithium ion battery including: a positive electrode material having: an oxide containing lithium and nickel; and a lithium compound deposited on a surface of the oxide, the lithium compound covering nickel present on the surface of the oxide.

However, Mao fails to disclose an assembled battery wherein a plurality of the lithium ion batteries are connected and installed in series or in parallel.

However, Itoh teaches that a plurality of lithium ion batteries (see paragraph 32), wherein the lithium batteries are installed in series or in parallel (see paragraphs 2 and 4). Itoh teaches that connecting a battery set in series increases capacity of the battery, and connecting them in parallel increases voltage. The combination of familiar elements is likely to be obvious when it does no more than yield predictable results. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. \_\_\_, \_\_\_, 82 USPQ2d 1385, 1395 – 97 (2007) (see MPEP § 2143, A.). Depending on whether one wanted to increase the capacity or voltage of the battery set, it would have been obvious to a person of ordinary skill in the art to connect the batteries in series or in parallel.

Regarding claim 8, Mao discloses a combined assembled battery, comprising: an assembled battery comprising: a non-aqueous electrolyte lithium ion battery including: a positive electrode material having: an oxide containing lithium and nickel; and a lithium compound deposited on a surface of the oxide, the lithium compound covering nickel present on the surface of the oxide.

However, Mao fails to disclose an assembled battery wherein a plurality of the lithium ion batteries are connected and installed in series or in parallel.

However, Itoh teaches that a plurality of lithium ion batteries (see paragraph 32), wherein the lithium batteries are installed in series or in parallel (see paragraphs 2 and 4). Itoh teaches that connecting a battery set in series increases capacity of the battery, and connecting them in parallel increases voltage. The combination of familiar elements is likely to be obvious when it does no more than yield predictable results. See *KSR International Co. v. Teleflex Inc.*, 550 U.S. \_\_\_, \_\_\_, 82 USPQ2d 1385, 1395 – 97 (2007) (see MPEP § 2143, A.). Depending on whether one wanted to increase the capacity or voltage of the battery set, it would have been obvious to a person of ordinary skill in the art to connect the batteries in series or in parallel.

Regarding claim 9, Mao in view of Itoh discloses a combined assembled battery according to claim 8, wherein the assembled battery is independently detachable (*Itoh*: see paragraph 42).

Regarding claim 10, Mao in view of Itoh discloses a combined assembled battery according to claim 8, wherein the combined assembled battery is mounted on a vehicle (*Itoh*: see paragraph 8).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ASHLEY KWON whose telephone number is (571)270-7865. The examiner can normally be reached on Monday to Thursday 7:30 - 6 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AK

/PATRICK RYAN/  
Supervisory Patent Examiner, Art Unit 1795